TECHNICAL NOTES

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Severe Winter Damage to Conifers Noted in Portions of North Dakota, 1955-56

Winter damage to planted conifers occurs frequently in North Dakota and occasionally reaches severe proportions. These conifers are a valuable component of shelterbelts, both esthetically and functionally, and the presence of the dead red foliage in the spring excites much comment. The winter of 1955-56 resulted in considerable injury in several areas of North Dakota. Informal surveys of the damage were made during July.1/

Winter burning of conifer foliage was especially severe in the vicinity of Larimore in the eastern portion of the State. Another area of extensive damage was found west of Fargo along U.S. Highway 10. In these areas ponderosa pine was heavily damaged, with the foliage above snowline completely browned; the foliage below the snowline was uninjured. Occasional trees with both the foliage and the buds killed were found; recovery of these trees with only a few whorls of low branches still alive is very unlikely. Those trees with live buds were recovering and will replace the lost foliage after several years' growth. Still the loss of foliage is serious, for the tree is weakened, the growth is slowed, and the thin foliage will reduce the effectiveness of the pines in retarding air movement. Damage to ponderosa pine was also noted in the vicinity of Denbigh, Bottineau, and Mandan, although it was considerably less extensive. Essentially no injury was seen in the natural stands in the Badlands of North Dakota.

The most vigorous ponderosa pines in row plantings suffered the least damage. Of course, it is impossible to say whether or not good vigor is the cause of lessened injury.

Junipers were also injured above snowline. However, because of the small stature of junipers in many of the plantings, a large portion of the trees was below the snowline. Thus the effect of such injury was less serious than on ponderosa pine. Again the damage was largely to the foliage, although some killing of buds occurred. No consistent difference in amount of damage was noticed in the two species commonly planted, Juniperus virginiana and J. scopulorum. No injury was seen in the natural stands of the Badlands.

(Over)

1/ Considerable aid was received from John Zaylskie, State Extension Forester, John Molberg and Duane L. Green at the North Dakota School of Forestry, and E. J. George, Agricultural Research Service, in locating areas of damage.

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White spruce, both the type form and the Black Hills variety, was the most resistant conifer observed, with extremely little damage noted. The few Scotch pine seen had some browned foliage. The staminate flowers developed abnormally, indicating injury although the vegetative portion of the buds was essentially uninjured.

Generally, there appeared no orientation of the damage with respect to direction. In areas of severe damage, browned foliage and dead buds occurred on all sides of the trees. Some exceptions were found where the most severe damage was on the south and southwest sides of the trees.

Extensive observations over so large an area, of course, cannot give any strong clue as to the cause of winter damage. Damage may occur in a number of ways. A warm moist fall followed by a sudden drop of temperature may result in extensive injury to the foliage. Under those circumstances vegetation does not harden sufficiently to withstand temperatures that, under more mormal conditions, would have little effect on conifers. At times, damage has been caused by fluctuations of temperature. Cold spells followed by warm bright days, especially if accompanied by strong dry winds, may cause transpiration of water from the needles and buds. Because the ground beneath the snow is frozen, water cannot be translocated to replace that lost, and tissue injury results; this is commonly referred to as winter drying. Late spring frosts that kill the newly opened buds and tender new foliage have also occurred. All of these factors may have operated during the past winter to cause the damage reported from different areas.